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AN ECONOMIC CLASSIFICATION OF LAND IN THE ELROSE - ROSETOWN - CONQUEST AREA, 1944.

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R. A. Stutt[1]

INTRODUCTION

The Elrose-Rosetown-Conquest area, which comprises twelve municipal units, was selected in 1944 for a study of wartime changes in Saskatchewan in mechanization, use of labour and livestock production. In obtaining the information from farmers, the addition of wheat yield histories from a representative sample facilitated the completion of an economic classification of land based on its suitability for wheat production. Prior to the commencement of hostilities in 1939 and up to and including the 1941 season, a total of seventy-six municipal units had been classified by field parties of the Economics Division, Dominion Department of Agriculture, in co-operation with the Department of Farm Management, University of Saskatchewan. In 1943 a small block of four rural municipalities were surveyed in the Cory-Asquith-Langham area. The 1944 program of research was a revival of the original plan to cover the Brown and Dark Brown prairie soils in Western Canada with the particular purpose in mind of delineating the problematical areas for crop production in a systematic manner.

The area selected for study lies along the border of the Brown and Dark Brown soil zones. It is a prairie area, although poplar "bluffs" appear in the northern section, particularly in the northeastern section. Wide variations in soil are found ranging from dune sand and fine sandy loam soils to the predominant loams, clays and heavy clays.

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The topography of the area ranges from level to rolling to steep. The western extension of the Missouri Coteau cuts through this area and along the escarpment the topography is rolling to steep. The section west of the escarpment, which is in the "third prairie steppe", is of higher elevation and is generally of rougher topography. Exceptions to this are the heavy clay soils near Plato. On the heavier-textured soils east of the Missouri Coteau large areas are of gently rolling to undulating topography and other select areas of a level phase.

AN ECONOMIC CLASSIFICATION OF LAND

All available information indicates the major importance of wheat in the general farm economy of this section of central and west-central Saskatchewan, accordingly, the basis of classification follows the course of action laid down in the earlier survey reports.[1]

Due to the variability in crop yields, characteristic of Western Canada farming, it has been difficult for the individual farmer to make a satisfactory long-time estimate of quantitative returns from his land. The primary purpose of this classification is to guide the farmer in this respect.

In the administrative field, too, there is corresponding need for such a grading of land in order to arrive at a sound agricultural program in keeping with the potentialities of the land resources.

Proportion of Total Area in Each Land Class

A total land area of 2,572,398 acres was included in this study. Arranged according to each grade of land, 30.4 per cent was in Land Class I (submarginal for wheat); 16.9 per cent in Land Class II (marginal for wheat); 20.4 per cent in Land Class III (fair wheat land); 13.1 per cent in Land Class IV (good wheat

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1. (a) Spence C. C. and Hope, E. C., "An Economic Classification of Land in Fifty-six Municipal Divisions, South Central Saskatchewan", Technical Bulletin No. 36, Dominion Department of Agriculture.

   (b) Stewart, A. and Porter, W. D., "Land Use Classification in the Special Areas of Alberta", Technical Bulletin No. 39, Dominion Department of Agriculture. See especially pages 7 to 22 inclusive.

land) and 19.2 per cent in Land Class V (excellent wheat land). This general area of twelve rural municipalities represents a marked superiority over the lands in any comparable survey area of previous years.

If comparison is made with two former studies - the Eyebrow-Lacadena area which borders that area on the southern edge and was surveyed in 1940, and with the more northern and partly wooded area at Cory-Asquith-Langham, surveyed in 1943 - this superiority is apparent.

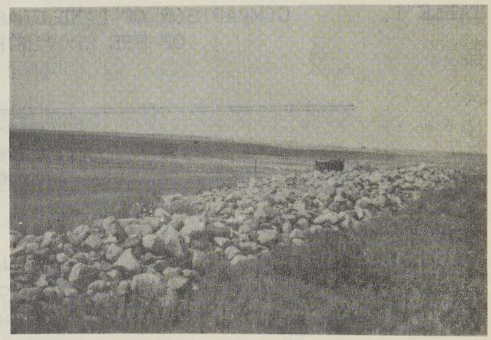
TABLE I. COMPARISON OF LAND CLASSIFICATION IN THREE AREAS OF THE PROVINCE OF SASKATCHEWAN

	Elrose-Rosetown-Conquest	Eyebrow-Lacadena	Cory-Asquith-Langham
		Per Cent	
Land Class			
I	30.4	40.4	31.2
II	16.9	16.6	30.7
III	20.4	27.8	29.1
IV	13.1	7.2	8.4
V	19.2	8.0	0.6
	100.0	100.0	100.0
Total Land Area		(in thousands)	
	2,572	1,943	775

Considerable variation in the proportion of land in each respective land class was noted by rural municipalities (see map). Rural municipalities having very large percentages (over 60 per cent) of submarginal and marginal lands for wheat were the rural municipalities of Montrose No. 315, Pleasant Valley No. 288, Coteau No. 255 and King George No. 256. On the other hand, the rural municipalities of St. Andrews No. 287 and Milden No. 286 had over 70 per cent in Land Classes IV and V (good and excellent wheat lands), while about half of the land area in the rural municipality of Monet No. 257 and Fairview No. 258 was in the respective grades of land. In the rural municipality of Mountain View No. 318, about 40 per cent was in the two higher grades of land. The prominence of this general area in the agricultural economy of this province is obvious from these

Rough, hilly land on Haverhill loam soil, suitable for grazing. Submarginal for wheat production, (Land Class I).

Marginal land for wheat production, (Land Class II). In addition to inferior qualities of the soil, the presence of large numbers of stones often makes farming extremely hazardous.



Fine stand of wheat on Regina heavy clay. Excellent wheat land, (Land Class V).

Typical good wheat land, (Land Class IV). Note rows of carraganas. Part of area included in Shelterbelt Association block at Conquest.

TABLE II.

ACREAGE AND PERCENTAGE OF TOTAL LAND AREA IN EACH LAND CLASS BY RURAL MUNICIPALITIES
Elrose-Rosetown-Conquest Area, 1944.

Rural Municipality	No.	Total		Land Class I		II		III		IV		V	
		Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Coteau	255	229262	100.0	92900	40.5	51236	22.3	62033	27.1	18821	8.2	4272	1.9
King George	256	204680	100.0	109127	53.3	42910	21.0	37460	18.3	6392	3.1	8791	4.3
Monet	257	273085	100.0	86153	31.6	17830	6.5	22377	8.2	35054	12.8	111671	40.9
Fairview	258	205889	100.0	61027	29.6	19968	9.7	24839	12.1	37377	18.2	62678	30.4
Fertile Valley	285	245382	100.0	35936	14.6	45244	18.4	101865	41.5	52897	21.6	9440	3.9
Milden	286	179916	100.0	17097	9.5	11920	6.6	21776	12.1	54059	30.1	75064	41.7
St. Andrews	287	204096	100.0	12922	6.3	7586	3.7	12526	6.1	29128	14.3	141934	69.6
Pleasant Valley	288	203578	100.0	78145	38.4	54565	26.8	39471	19.4	15738	7.7	15659	7.7
Montrose	315	217803	100.0	129537	59.5	39821	18.3	42865	19.7	5580	2.5	-	-
Harris	316	196941	100.0	74708	37.9	41513	21.1	54946	27.9	25774	13.1	-	-
Marriott	317	206000	100.0	49294	23.9	56920	27.6	60894	29.6	24341	11.8	14551	7.1
Mountain View	318	205966	100.0	34023	16.5	45281	22.0	44763	21.7	32633	15.9	49266	23.9
Total		2572598	100.0	780869	30.4	434794	16.9	525815	20.4	337794	13.1	493326	19.2

figures. They stamp this area out as one of the most important areas in the province from the standpoint of agricultural wealth.

Of the 2,572,598 acres in the area of survey, 1,727,666 acres were considered to be arable for crop production and of these, 1,690,483 acres were improved at the time of the survey. The balance of the arable land, 37,183 acres, was classified as follows: 20 per cent in Land Class I; 30 per cent in Land Class II; 30 per cent in Land Class III; 13 per cent in Land Class IV and 7 per cent in Land Class V. Thus 50 per cent of the arable unimproved land, about 18,500 acres, was in desirable grades.

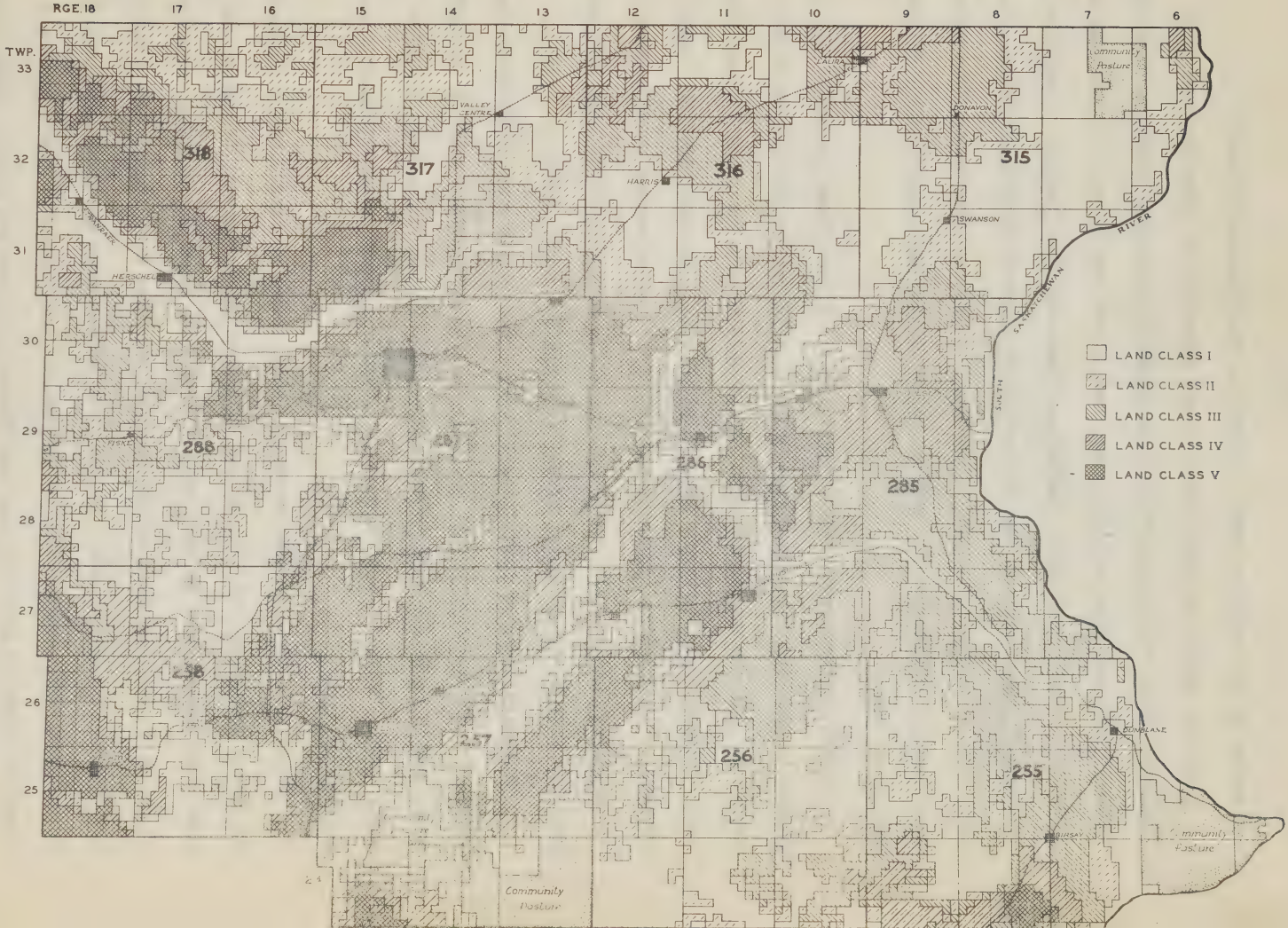
A Physical Description of the Area by Land Class

In presenting this section on physical description, it has been the custom in past reports to proceed from the less desirable lands, (Land Classes I and II), to the superior grades of land. In this report, however, due to the prevalence of the large block of heavy clay lands in the central, southwest and northwest corners of the area, it has been decided to reverse the procedure.

Extensive numbers of parcels of land in the rural municipalities of Milden No. 286, Monet No. 257, Fairview No. 258 and especially St. Andrews No. 287, were graded as Land Class V. Soils on these parcels were mainly "Regina" heavy clay, "Sceptre" heavy clay and mixtures of these. Parcels were practically 100 per cent cultivatable, free from stones, level to undulating and relatively well drained. Long-time wheat yield histories on these soils indicated a very high stage of productivity and large areas were rated in the upper limits of this grade of land. Highway No. 4, in the section from Elrose to Rosetown, passes through this grade of land and generally forms the western edge of the largest block of Land Class V. The towns of Hughton, Glamis, Sovereign and Milden are located on this class of land. In the section in the southwest portion of the area, the town of Plato is the most easily distinguished point. There is also a section of this superior grade of land in the rural municipalities of 317 and 318 which borders the north edge of Herschel and Stranraer. In the western

ECONOMIC CLASSIFICATION OF LAND

ELROSE—ROSETOWN—CONQUEST AREA



extension of the belt the area is known as the "Glengarry flats".

Parcels graded as Land Class IV were generally of clay loam and clay texture. Soils representative of this grade of land were "Weyburn" clay loam; "Elstow" clay and clay to silty clay loam of the Dark Brown soil zone and mainly found near Bounty, Conquest, Tessier and Zealandia and "Sceptre" heavy clay to "Haverhill" clay loam and "Fox Valley" silty clay of the Brown soil zone in the area about 4 to 6 miles south of Rosetown, in the northern part of the rural municipality of Fairview No. 258 and parts of the rural municipality of Pleasant Valley No. 288.

Typical parcels and areas of Land Class III were found in relatively large blocks in the rural municipalities of Fertile Valley No. 285, Marriott No. 317, Harris No. 316 and Coteau No. 255. Soils were mainly "Haverhill" loam; "Elstow" loam; "Elstow" and "Weyburn" loam; "Elstow" silt loam; and "Asquith" light loam. Parcels of land having approximately 120 to 150 acres arable, with moderate amounts of sloughs or waste lands, were typical, while many parcels of superior types of soil but with 80 to 120 acres arable were placed in this grade of land.

Extensive areas of Land Class II were found in the rural municipalities of Coteau No. 255 and King George No. 256, in the southeastern part of the survey area, and in north and west central sections. Typical soils were "Asquith" fine sandy loams; "Weyburn" and "Haverhill" loams and light loams with gently rolling to rolling topography.

There were three general areas of lands graded as Land Class I (submarginal for wheat production) as well as the odd parcel interspersed throughout the whole area. The main blocks of this type of land were found in the rural municipalities of Coteau No. 255 and King George No. 256; Montrose No. 315 and Harris No. 316; and Pleasant Valley No. 288. In the first block there are large sections of sandy loams, very rough phases of "Haverhill" and "Weyburn" light loams and loams, "Chaplin" sandy or gravelly loam and "Haverhill" loam and alkali. East of Swanson and Donavon and in the eastern part of the rural municipality of Harris No. 316,

there are large areas of sandy soils, "Asquith" sandy loam and alkali. All these soils are of low relative productivity and of low drought resisting qualities. Many parcels graded as Land Class I were often very stony, of rough topography or low and depressional.

Ownership

The pattern of ownership of land in this area is typical of any area in the Prairie Provinces. To encourage rapid settlement, a liberal land policy was designed by the federal government and the railways. About 78 per cent was owned by private persons. Two thirds was owned by those actually operating the land or living in the locality; approximately 6 per cent by private persons living elsewhere in Saskatchewan and an additional 8 per cent by private persons living outside Saskatchewan. Publicly-owned crown lands amounted to 250,692 acres, or 9.7 per cent, and lands held by the various municipal units to 100,475 acres, or 3.9 per cent.

Mortgage, insurance or trust companies held 115,575 acres of land, or 4.5 per cent of the area. Lesser amounts were held by other classes of owners, such as 62,779 acres by railway companies (mainly in Fairview No. 258 and King George No. 256) and 25,289 acres by the Hudson's Bay Company.

The distribution of land by land class held by various classes of owners is given in table III. It will be observed that over 97 per cent of the total acreage of Land Class V and 95 per cent of Land Class IV were in private ownership. Land held by the Crown, rural municipalities, railways and the Hudson's Bay Company is largely classified Land Class I and II.

Occupied, Vacant and Abandoned Lands

In 1944, when the survey was made, 88.2 per cent was occupied by a resident in the vicinity or nearby for farming or grazing purposes. An additional 8.1 per cent was vacant and had not been used for agricultural purposes and only 18,288 acres, or 0.7 per cent, was abandoned for cropping. A total of 77,458 acres was used in P.F.R.A. community pastures located in four different municipal divisions.

TABLE III.

STATEMENT OF LAND OWNERSHIP IN TWELVE RURAL MUNICIPALITIES ACCORDING TO LAND CLASS
Elrose-Rosetown-Conquest Area, 1944.

	Land Class I		II		III		IV		V		Total	
	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%
Private Owner Living:												
In Locality	277819	35.6	316617	72.8	404665	77.0	276015	81.7	387007	78.5	1662123	64.6
Elsewhere in Sask.	32164	4.1	27201	6.2	36972	7.0	18290	5.4	33508	6.8	148135	5.7
Outside Sask.	41164	5.3	30248	7.0	40741	7.7	27319	8.1	60558	12.3	200030	7.8
Total Privately Owned	351147	45.0	374066	86.0	482378	91.7	321624	95.2	481073	97.6	2010288	78.1
Rural Municipality	94780	12.1	4578	1.1	798	0.2	159	-	160	-	100475	3.9
Crown Land	222729	28.5	10137	2.3	9392	1.8	3653	1.1	4781	1.0	250692	9.7
Hudson's Bay Co.	20331	2.6	3680	0.8	1278	0.2	-	-	-	-	25289	1.0
Railway Companies	43566	5.6	10410	2.4	6593	1.3	1593	0.5	617	0.1	62779	2.5
Mort., Ins. & Trust Co's	45708	5.9	30425	7.0	24410	4.6	10445	3.1	4587	0.9	115575	4.5
Other	2608	0.3	1498	0.4	966	0.2	320	0.1	2108	0.4	7500	0.3
Total	780869	100.0	434794	100.0	525815	100.0	337794	100.0	493326	100.0	2572598	100.0

There are two community pastures in the rural municipality of Monet No. 257, one in the rural municipality of Coteau No. 255 and one in the rural municipality of Montrose No. 315.

Outside of lands graded as submarginal for wheat production, (Land Class I), nearly all was occupied (see table IV). The highest proportion of vacant and abandoned land was found in the rural municipalities of King George No. 256, Fairview No. 258 and Montrose No. 315.

The extremely high percentage of lands in Land Class I termed as vacant (lands which were not in use in 1944 but may have been at various dates, and upon which no appreciable amounts have been cultivated), as compared with only 12 per cent in fifty-six municipal divisions of the 1936-37-38-39 economic survey areas[1], indicated an operative and selective process at work. Lands formerly occupied and farmed and subsequently abandoned were indicated as "abandoned" and made up only 1.7 per cent in Land Class I as compared with 10 per cent in the previously surveyed areas.

Tenure

In this area at the time of the survey, approximately 92 per cent of the occupied land, shown as owned or rented in table V, consisted of parcels which are being used for farming. Three per cent was leased and used for grazing and hay purposes and 3.3 per cent was in community pastures and used for grazing. The balance, 2.1 per cent was mainly held by persons outside the area of the survey and on which the information regarding tenure was incomplete.

Outside of Land Class I nearly all lands were used for agricultural purposes. Broken down by rural municipality, the greatest proportion of grazing land was found in the southern row of rural municipalities (No.'s 255, 256, 257 and 258), and in the rural municipality of Montrose No. 315. The highest per-

1. Spence, C. C. and Hope, E. C., "An Economic Classification of Land in Fifty-six Municipal Divisions, South-Central Saskatchewan", Technical Bulletin No. 36, Economics Division, Dominion Department of Agriculture.

TABLE IV.

ACREAGE AND PERCENTAGE OF OCCUPIED, COMMUNITY PASTURE,
VACANT AND ABANDONED LAND IN TWELVE RURAL MUNICIPALITIES BY LAND CLASS
Elrose-Rosetown-Conquest Area, 1944.

	Land Class											
	I		II		III		IV		V		Total	
	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%
Occupied	491041	62.9	427224	98.2	521635	99.2	336516	99.6	492212	99.8	2268628	88.2
Community Pasture	77458	9.9	-	-	-	-	-	-	-	-	77458	3.0
Vacant	199279	25.5	4214	1.0	2820	0.5	1118	0.4	793	0.2	208224	8.1
Abandoned	13091	1.7	3356	0.8	1360	0.3	160	-	321	-	18288	0.7
Total	780869	100.0	434794	100.0	525815	100.0	337794	100.0	493326	100.0	2572598	100.0

TABLE V.

ACREAGE AND PERCENTAGE OF OWNED, RENTED, LEASED, COMMUNITY PASTURE AND OTHER LAND IN TWELVE RURAL MUNICIPALITIES BY LAND CLASS
Elrose-Rosetown-Conquest Area, 1944.

	Land Class											
	I		II		III		IV		V		TOTAL	
	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%
Owned	203820	35.8	241184	56.4	318882	61.1	218688	65.0	313811	63.7	1296385	55.3
Rented	194757	34.3	177254	41.5	195181	37.4	111094	33.0	173035	35.2	851321	36.3
Leased	63991	11.3	2078	0.5	1274	0.3	800	0.6	159	0.2	70567	3.0
Community Pasture	77458	13.6	-	-	-	-	-	-	-	-	77458	3.3
Other	28473	5.0	6708	1.6	6298	1.2	5934	1.4	5207	0.9	50355	2.1
Total	568499	100.0	427224	100.0	521635	100.0	336516	100.0	492212	100.0	2346086	100.0

centage of owner-occupied agricultural land was found in Pleasant Valley No. 288; Fairview No. 258; Milden No. 286 and St. Andrews No. 287. This percentage ranged from 68 to 59 per cent for the above four municipal units.

Assessed Value of Occupied Lands in Relation to Land Class

A completely new reassessment of all farm lands in this area was conducted by the Saskatchewan Assessment Commission in 1942 and 1943. The Saskatchewan system of rural land assessment is probably the most scientific method of assessment for agricultural land in Canada, if not on the American continent, and employs up-to-date methods of rating the different soils and evaluating lands according to their productive capacity.

The assessed valuation of occupied lands for which the information was available was arranged according to land class and rural municipality and is shown in table VI.

TABLE VI.

ASSESSED VALUE OF OCCUPIED LAND PER ACRE BY LAND CLASS AND RURAL MUNICIPALITIES EXCLUDING COMMUNITY PASTURES AND PARCELS WITH NO INFORMATION
Elrose-Rosetown-Conquest Area, 1944.

Rural Municipality	No.	Land Class I Value per Acre	II Value per Acre	III Value per Acre	IV Value per Acre	V Value per Acre	Total Value per Acre
		$	$	$	$	$	$
Coteau	255	3.37	7.37	11.41	18.54	23.88	8.90
King George	256	3.22	7.55	12.30	18.49	25.46	7.64
Monet	257	2.89	8.16	12.58	18.50	26.06	18.18
Fairview	258	4.42	8.91	13.91	19.40	25.62	16.42
Fertile Valley	285	3.87	7.89	11.71	18.01	23.15	11.73
Milden	286	3.78	7.98	12.92	19.82	24.93	18.87
St. Andrews	287	4.31	8.00	12.82	19.34	25.12	21.74
Pleasant Valley	288	4.05	7.97	13.05	19.30	26.20	10.17
Montrose	315	2.76	6.96	12.37	17.97	-	6.40
Harris	316	3.24	7.71	12.92	17.48	-	8.98
Marriott	317	3.70	7.71	12.68	17.89	24.42	10.81
Mountain View	318	3.29	7.72	12.31	18.55	24.95	14.03
Total		3.42	7.72	12.37	18.72	25.32	12.90
Low		2.76	6.96	11.41	17.48	23.15	6.40
High		4.42	8.91	13.91	19.82	26.20	21.74
Range		1.66	1.95	2.50	2.34	3.05	15.34

A high degree of correlation was noted between the assessed value per acre and land class. Taking all land in each land class with assessment information, the average figure increased from $3.42 in Land Class I to $7.72, $12.37, $18.72 and $25.32 for Land Classes II, III, IV and V, respectively. The range of values in the same land classes as assessed in different municipalities was not great though proportionately wider in the lower than the higher classes; the variations of range to average valuation being, in Land Class I 48 per cent, Land Class II 25 per cent, Land Class III 20 per cent, Land Class IV 12 1/2 per cent and Land Class V 12 per cent.

Soil Erosion

In connection with the analysis of supplementary data pertaining to this study, information as to the type, extent and severity of soil erosion was given some consideration. In the reassessment of the municipal units of this area, conducted in 1942 and 1943, deductions were made for erosion of the soil and this provided the basic data for this analysis.

Type of erosion was listed under three main types: (1) wind, (2) water, and (3) a combination of wind and water. Deductions for erosion were made only for cultivated and cultivated idle land. With regard to extent, parcels were coded in the following groups: no acres affected; up to 40 acres affected; 41-80 acres affected; and over 80 acres affected. Parcels having up to and including 5 points deducted were termed slight to moderately affected; from 6 to 15 points deducted as moderately severe to severely affected; and over 15 points deducted as very severely affected.

On this basis, 15.9 per cent of 12,802 parcels of land, (a parcel usually being 160 acres), had no erosion damage; 62.7 per cent of the parcels were affected by wind damage; 6.3 per cent were affected by water damage; and 15.1 per cent had a combination of wind and water damage. A total of 66.4 per cent of the parcels had over 80 acres affected, mainly in the slight to

TABLE VII.

DISTRIBUTION OF PARCELS OF LAND HAVING SOME CULTIVATION BY TYPE, EXTENT AND SEVERITY OF EROSION, FOR ALL LAND CLASSES
Elrose-Rosetown-Conquest Area, 1944.

Extent and Severity of Erosion	All Land Classes				
	No Damage	Wind	Water	Wind & Water	Total
No cultivation affected	2031	-	-	-	2031
Up to 40 acres affected					
Slight to moderate	-	514	172	107	793
Moderately severe to severe	-	17	1	1	19
Very severe	-	8	-	-	8
41-80 acres affected					
Slight to moderate	-	980	135	300	1415
Moderately severe to severe	-	19	-	1	20
Very severe	-	8	-	-	8
Over 80 acres affected					
Slight to moderate	-	6321	502	1516	8339
Moderately severe to severe	-	137	2	3	142
Very severe	-	27	-	-	27
Total	2031	8031	812	1928	12802

moderate category, but 142 and 27 of the parcels having over 80 acres affected were in the moderately severe to severe and the very severe categories, respectively. These are mainly of the wind type of erosion grouping. Combining all parcels of various acreages affected, 97.9 per cent are of the slight to moderate group; 1.7 per cent are of the moderately severe to severe group; and 0.4 per cent of the 12,802 parcels are of the very severe group.

TABLE VIII.

DISTRIBUTION OF PARCELS OF LAND HAVING EROSION DAMAGE ACCORDING TO TYPE, EXTENT AND SEVERITY
Elrose-Rosetown-Conquest Area, 1944.

	Wind	Water	Wind & Water	Total
Slight to moderate	7815	809	1923	10547
Moderately severe to severe	173	3	5	181
Very severe	43	-	-	43
Total	8031	812	1928	10771

Expressed in terms of acreage instead of parcels of land affected, approximately one third of the 1,690,483 acres of improved land was not affected by soil erosion; about one half had wind damage; 72,040 acres or 4.3 per cent had water erosion; and the balance of 12.0 per cent had combined detrimental effects from wind and water. (See table IX.)

Breaking the problem down to the various grades of land, it was apparent that wind damage was of greatest relative extent in Land Class I (submarginal for wheat production); Land Class II (marginal for wheat production); and Land Class III (fair wheat land). On these grades of land about two thirds of the improved land was affected by wind damage; about one fifth had no damage; approximately two per cent had water damage; and about one eighth had wind and water damage.

The proportion of improved land affected by soil erosion was considerably less in Land Classes IV and V (good and excellent wheat lands). About one third of the improved land in Land Class IV and nearly two thirds in Land Class V had no damage. In Land Class IV about one half of the 321,925 acres of the improved land was affected by wind damage as compared with about one fifth of the 488,606 acres in Land Class V. In Land Class IV the combined wind and water damage affected 42,600 acres or 13.2 per cent, and in Land Class V 32,720 acres or 6.7 per cent.

Damage to the soil by water was of greatest significance on the heavier textured soils. The percentage affected by water only was about 2 per cent in the poorer grades of land; approximately 5 per cent in the good wheat lands (Land Class IV) and 8. 3 per cent in the excellent wheat lands (Land Class V).

These figures have shown the prevalence of damage mainly from wind and also the extent of damage. The severity of this damage appears to be found to the largest extent on the poorest grades of land. About 10 per cent of the improved acreage under cultivation and affected by erosion, in Land Class I (submarginal for wheat), is moderately severe to very severely affected, with

An indication of the extent of wind erosion on light textured soils.

Erosion on shallow phase of Weyburn loam. Note light-coloured hill tops and exposed stones.

about 4 per cent of this in the very severe category. In Land Classes IV and V only 380 acres were in these categories. However, the large percentage of improved land in this area is found in the better grades of land, and while most of this land is slightly to moderately affected, the problem warrants very serious consideration in order to prevent further depletion. The analysis of the factor of soil erosion adds further significance to the economic classification of lands in southern Saskatchewan as an aid to a program of land conservation.

TABLE IX.

IMPROVED ACREAGE ARRANGED BY SEVERITY OF EROSION ACCORDING TO LAND CLASS
Elrose-Rosetown-Conquest Area, 1944.

	Wind	Water	Wind & Water	Total
			acres	
Land Class I				
Slight to moderate	53780	3060	12060	68900
Moderately severe to severe	4420	-	140	4560
Very severe	2860	-	-	2860
Total Affected	61060	3060	12200	76320
Land Class II				
Slight to moderate	203760	6940	61540	272240
Moderately severe to severe	11820	-	180	12000
Very severe	1020	-	-	1020
Total Affected	216600	6940	61720	285260
Land Class III				
Slight to moderate	310500	6080	53260	369840
Moderately severe to severe	1680	-	-	1680
Very severe	-	-	-	-
Total Affected	312180	6080	53260	371520
Land Class IV				
Slight to moderate	159060	15220	42600	216880
Moderately severe to severe	-	260	-	260
Very severe	-	-	-	-
Total Affected	159060	15480	42600	217140
Land Class V				
Slight to moderate	100500	40480	32600	173580
Moderately severe to severe	-	-	120	120
Very severe	-	-	-	-
Total Affected	100500	40480	32720	173700
All Land Classes				
Slight to moderate	827600	71780	202060	1101440
Moderately severe to severe	17920	260	440	18620
Very severe	3880	-	-	3880
Total Affected	849400	72040	202500	1123940

WHEAT YIELD HISTORY ANALYSIS

Information pertaining to the history of wheat yields in the Elrose-Rosetown-Conquest area was obtained from 606 records provided by farmers and taken during the summer of 1944. Of these 606 records, 374 had yield information for each year of the 1921-36 period and 355 records had complete yield information for the 1921-43 period. The 606 records were scattered throughout the twelve municipalities and gave some yield information on 64 soil types mapped in the Assessment Commission's soil mapping of the area.

Yields by Soil Types

The yield estimates were classified by soils on the basis of the Assessment Commission's soil mapping and also on the basis of the No. 12 Soils Map of the Soils Department, University of Saskatchewan. A comparison of yield averages by soil types, according to these two maps, is outlined in Table X. The soils on which comparable yield information was obtained were divided into four groups, viz. the clays and heavy clays, clay loams to loams, loams to light loams and fine sandy loams to sands. It was found that the yield averages for soil associations classified according to the Assessment Commission's mapping, as compared with the yield averages on comparable soil types, as classified by the No. 12 Soils Department Map, were higher on the heavier-textured soils, about the same on the medium-textured soils and lower on the lighter soils. This relationship seemed to indicate that the Assessment Commission's mapping was the most accurate classification of soils in this area and hence it was used as the basis for studying the productivity of the various soil associations in this area.

Since the Assessment Commission's mapping was fairly detailed, the sample of records taken was broken up into a large number of different soil associations, some of which were represented by only a small number of yield records.

TABLE X.

COMPARISON OF AVERAGE YIELDS BY SOIL TYPES ACCORDING TO SOILS DEPARTMENT SOILS MAP AND ASSESSMENT COMMISSION SOILS MAP
1921-43 Averages

Clays and Heavy Clays				Clay Loams to Loams			
Soil Type	Soils Dept.	Assess. Comm.	Diff.	Soil Type	Soils Dept.	Assess. Comm.	Diff.
RHvC	18.9	18.9	0.0	ECL	12.6	14.1	1.5
ScHvC	16.6	16.6	0.0	ESiCL	14.5	14.9	0.4
ScC-HrCL	14.4	19.2	4.8	ECL-WL	14.2	16.0	1.8
ScHvC-HrCL	15.2	15.3	0.1	ESiCL-SiL	14.0	13.1	-0.9
Sc-RHvC	17.1	15.6	-1.5	HrCL	16.4	18.4	2.0
EC	15.3	17.6	2.3				
EC-SiCL	13.5	16.8	3.3				
Average Difference (Assess. Comm. - Soils Dept.)			1.27				0.96

Loams to Light Loams				Fine Sandy Loams to Sands			
Soil Type	Soils Dept.	Assess. Comm.	Diff.	Soil Type	Soils Dept.	Assess. Comm.	Diff.
EL	14.3	14.0	-0.3	AVFSL	12.0	8.4	-3.6
ESiL	13.1	11.1	-2.0	AFSL	10.8	10.0	-0.8
EL-ALL	8.6	12.7	4.1	S-DS	8.0	9.2	1.2
WL	13.7	13.8	0.1	Alk	11.4	6.4	-5.0
W-EL	13.1	12.7	-0.4				
HrL	13.8	13.7	-0.1				
HrL-WL	13.3	13.2	-0.1				
ALL	12.5	11.8	-0.7				
Average Difference (Assess. Comm. - Soils Dept.)			0.075				-2.05

Since these small samples were not sufficiently reliable, the sample was increased by including yield records taken in rural municipalities Nos. 228, 226, 225 and part of 224, and Local Improvement District No. 227, during the 1940 survey. These municipalities are on the southern and southeastern boundary of the Elrose-Rosetown-Conquest area. Records taken in the Cory-Asquith-Langham area in 1943, which is contiguous to the northeast corner of the Elrose-Rosetown-Conquest area, were also included. All these records were re-classified by soil on the basis of the Assessment Commission's soil mapping. The 1921-36 average

and the estimate for each of the individual years from 1937 to 1943 inclusive, was listed for each record, according to soil type. The aggregates of averages and number of estimates were then calculated and the aggregates on the same soil type, in each of the areas, were then combined in an average calculated for the 1921-36 period, as well as an average for each individual year from 1937 to 1943 inclusive. The 1921 to 1943 average was calculated by multiplying the 1921 to 1936 average by 16, adding to the resulting sum the average for the succeeding individual years (1937 to 1943) and dividing the total by 23, i. e. (number of years from 1921 to 1943). A sample table showing the method of expanding the yield information on Sceptre Heavy Clay is shown in table XI.

By using this method, it was possible to increase the size of sample of a representative cross section of the light, medium and heavy soils in the area. These expanded samples provided a reliable core of information around which the soils having scanty or no information could be grouped.

TABLE XI.

EXPANDED WHEAT YIELD AVERAGE ON SCEPTRE HEAVY CLAY, EYEBROW-LACADENA, ELROSE-ROSETOWN-CONQUEST, CORY-ASQUITH-LANGHAM AREAS, SASKATCHEWAN ASSESSMENT COMMISSION SOIL MAPPING.

	1921-36		1937		1938		1939		1940		1941		1942		1943		1921-43
	No.	Agg.	No.	Agg.	No.	Agg.	No.	Agg.	No.	Agg.	No.	Agg.	No.	Agg.	No.	Agg.	
L.I.D. 227	14	234	17	9	17	207	29	786									
R.M. 228	16	237	27	9	28	417	58	1499									
Elrose-Rosetown-Conquest	2	32	8	23	8	96	8	252	8	209	8	114	8	273	8	90	
Total	32	503	52	41	53	620	95	2537	8	209	8	114	8	273	8	90	
Average	15.7		0.8		11.7		26.7		26.1		14.2		34.1		11.2		16.3

Yields by Soil Groups

The basis for grouping the soils in the Elrose-Rosetown-Conquest area was the comparative index rating developed by the Soils Department, University of Saskatchewan, and outlined in the No. 12 Soils Survey Report.[1] The comparative index rating of each soil type and each soil mixture was determined and each soil was classified into one of ten groups, depending upon the size of its index. The groups were determined arbitrarily, by including any soils having an index of 80 and over in the first group and dividing the remaining soils into nine groups, each group having an index interval of six points. Although no index rating was indicated in the Soils Survey Report for sands, dune sand or alkali, these soils were included in Group X, since our yield information on these soils indicated a yield comparable to this group. Table XII lists the comparative index ratings of all soil types in the Elrose-Rosetown-Conquest and Cory-Asquith-Langham areas, for which yield information was obtained.

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1. For further information see "A Method of Obtaining a Comparative Rating of Saskatchewan Soils", J. Mitchell, Sci. Agric. 20:5, 1940.

TABLE XII.

COMPARATIVE INDEX RATING GROUPS OF SOIL TYPES HAVING AVAILABLE YIELD INFORMATION, ELROSE-ROSETOWN-CONQUEST AND CORY-ASQUITH-LANGHAM AREAS.

Soil Groups	I		II		III		IV		V	
Comparative Index Rating (Soils Dept.)	80		74-79		68-73		62-67		56-61	
	Soil Type	Index	Soil Type	Index	Soil Type	Index	Soil Type	Index	Soil Type	Index
	RHvC	82	Sc-RHvC	79	ScHvC-C	71.5	ScC	67	WCL	61
			RHvC-EC	78	EC-SiCL	71	ScHvC-HrCL	66	ESiCL-L	60.5
			ScHvC	76	ESiCL	68	RC-HrCL	66	ESiCL-WL	60
			EC	74	EC-WCL	67.5	ECL	64	ESiCL-SiL	59
							FxSiC	64	ECL-WCL-L	59
							FxC	64	ECL-L	58.5
							E-WCL	62.5	FxSiC-CL	58.5
							ScC-HrCL	61.5	Hr-WCL	58.5
									ECL-SiL	57
									WCL-L	56.5
									HrCL	56
									ESiCL-SiL-WL	56
									ECL-WL	58

Soil Groups	VI		VII		VIII		IX		X	
Comparative Index Rating (Soils Dept.)	50-55		44-49		38-43		32-37		31 and Under	
	Soil Type	Index	Soil Type	Index	Soil Type	Index	Soil Type	Index	Soil Type	Index
	FxHrCL	54.5	EL-ALL	48	ALL	43	FxSiL	37	HtLL	29
	FxSiCL-HrCL	54.5	HrL-WL	48	EL-AFL	43	HrL-HtLL	36.5	HtLL-FL	25.5
	FxC-HrL	54	ECL-AFL	48.5	W-HrL-LL	42	AVL-FL	35.5	S-DS	-
	W-HrCL-L	53.6	ESiL-ALL	46.5	FxL	38	FxL-HtLL	33.5	Alk	-
	FxSiCL	53	EL-AVL	45.5	ALL-FL	38	AFL	33		
	EL	53	HrL	44	HrL-LL	38				
	E-WL	52.5	ESiL-AVL	44	AVL	38				
	WL	52								
	WL-ESiL	51								
	HrCL-L	50								
	ESiL	50								

Average Yield 1921-43 by Soil Groups:- The method of calculating the 1921-43 average yield for each soil group is outlined in table XIII. Whenever expanded averages were available, they were used as the yield average of that particular soil. When they were not available, the average yields (1921-43), as calculated from the records having a complete yield history throughout the period, were used. These averages were then weighted according to the size of each sample and the weighted average calculated for the group.

Exceptions to this procedure were made in six of the individual soil types shown in table XIII. These soils, FxSiC, EL, ESiL, W-HrL-LL, ECL-AFL, EL-AVL, were all represented by small samples (less than five) and the averages, as calculated from the records having complete information showed a large deviation from the average of the group to which each of these soils belonged. Hence, the averages used for these particular soils were the averages calculated from the averages of each individual year for all records taken on that particular soil type whether the records were complete throughout or not. The number of sample or weight used was the number of records having a complete yield history (1921-43).

TABLE XIII

CALCULATION OF THE WEIGHTED 1921-43 PERIOD YIELD AVERAGES FOR COMPARATIVE INDEX RATING SOIL GROUP ELROSE-ROSETOWN-CONQUEST AND CORY-ASQUITH-LANGHAM AREAS. ASSESSMENT COMMISSION SOILS MAPPING.

Soil Type	No. Records	Av. Yield '21-'43
Group I.		
RHvC	35	18.9
Wt'ed Group Av.		18.9
Group II.		
RHvC-EC	8	19.6
Sc-RHvC	6	16.8
ScHvC	32	16.3
EC	19	17.1
Total Records	65	
Wt'ed Group Av.		17.0
Group III.		
ScHvC-C	7	17.6
EC-SiCL	11	16.2
ESiCL	13	14.5
EC-WCL	5	15.4
Total Records	36	
Wt'ed Group Av.		15.7
Group IV.		
ScC	5	14.0
ScHvC-HrCL	3	15.7
RC-HrCL	-	-
ECL	3	13.3
/ FxSiC	5	15.9
FxC	4	14.5
E-WCL	3	15.0
ScC-HrCL	1	16.0
Total Records	24	
Wt'ed Group Av.		14.8
Group V.		
WCL	4	12.8
ESiCL-L) ESiCL-SiL) ECL-L) ECL-SiL)	23	13.3
ECL-WL	8	16.4
ESiCL-WL	1	12.0
ECL-WCL-L	4	13.2
FxSiC-CL	2	12.0
Hr-W-CL	14	12.9
WCL-L	5	13.4
HrCL	34	14.6
ESiCL-SiL-WL	-	-
Total Records	95	
Wt'ed GroupAv.		13.9
Group VI.		
Fx-HrCL	3	14.6
FxSiCL-HrCL	-	-
FxC-HrL	2	11.0
W-HrCL-L	5	13.4
FxSiCL	1	13.0
/ EL	8	15.5
E-WL) WL-ESiL)	10	13.7
WL	26	13.8
HrCL-L	15	13.5
/ ESiL	5	11.8
Total Records	75	
Wt'ed Group Av.		13.7
Group VII.		
EL-ALL	21	12.5
HrL-WL	16	13.5
/ ECL-AFL	1	10.5
ESiL-ALL	2	14.0
/ EL-AVL	1	19.6
HrL	35	13.0
ESiL-AVL	1	11.0
Total Records	77	
Wt'ed Group Av.		13.0
Group VIII.		
ALL	18	11.9
EL-AFL	6	13.3
/ W-HrL-LL	2	14.9
FxL	1	12.0
ALL-FL) AVL)	24	11.8
HrL-LL	3	12.3
Total Records	54	
Wt'ed Group Av.		12.2
Group IX.		
FxSiL	-	-
HrL-HtLL	-	-
AVL-FL	1	11.2
FxL-HtLL	1	10.0
AFL	38	10.5
Total Records	40	
Wt'ed Group Av.		10.5
Group X.		
HtLL) HtLL-FL) S-DS) Alk)	7	8.8
Wt'ed Group Av.		8.8

/ Average yield indicated for these soil types is the average of the averages of the individual years for all records, whether they were complete throughout the yield period or not.

It will be noted that the final yield computed for the group is a weighted yield average, i. e. it is weighted most heavily by the particular soil in the group having the largest number of records. In this way, most emphasis is placed on the most reliable average in the group. However, this method tends to over-emphasize the importance of that particular soil in the group. This limitation is most apparent if the soil having the largest sample is at the extreme top or extreme bottom of the group, and least evident if its index rating is midway in the interval of the group.

A Comparison of 1921-43 and 1921-36 Yield Information

For each municipal unit a count was made of the number of years from 1937 to 1943 inclusive, which fall above and below the 1921-36 average for the municipality. (See table XIV.) In nine of the rural municipalities out of twelve, there were three years having an average yield above, and four years having an average yield below, the 1921-36 period average, during the period from 1937-43. Two rural municipalities showed four years above and three below and one rural municipality showed two years above and five below the 1921-36 period average.

TABLE XIV.

COMPARISON OF YIELDS FOR INDIVIDUAL YEARS 1937-43 WITH THE 1921-36 AVERAGES.

R.M.	1921-36 Av.	1937 Av.	1937 Rel./	1938 Av.	1938 Rel.	1939 Av.	1939 Rel.	1940 Av.	1940 Rel.	1941 Av.	1941 Rel.	1942 Av.	1942 Rel.	1943 Av.	1943 Rel.	Summary Higher	Summary Lower
315	10.7	0	L	8.2	L	16.5	H	14.4	H	7.9	L	21.4	H	10.2	L	3	4
316	11.8	0.1	L	10.6	L	22.1	H	21.1	H	8.4	L	27.2	H	11.0	L	3	4
317	12.9	0.1	L	9.5	L	22.6	H	23.2	H	8.2	L	26.1	H	10.8	L	3	4
318	15.2	1.9	L	12.4	L	22.8	H	25.4	H	12.0	L	28.3	H	9.9	L	3	4
285	12.8	0.2	L	9.7	L	21.7	H	15.0	H	5.5	L	25.0	H	13.4	H	4	3
286	15.7	1.0	L	11.0	L	27.0	H	24.2	H	6.7	L	32.1	H	15.8	H	4	3
287	18.2	2.7	L	17.0	L	31.8	H	33.9	H	12.5	L	38.3	H	17.0	L	3	4
288	14.9	1.2	L	14.3	L	20.7	H	24.9	H	14.0	L	28.4	H	9.3	L	3	4
255	13.4	0.2	L	10.4	L	19.4	H	11.0	L	7.7	L	25.8	H	14.7	H	3	4
256	14.2	0.4	L	8.4	L	23.0	H	10.9	L	7.0	L	23.5	H	9.9	L	2	5
257	15.3	2.2	L	13.6	L	25.6	H	23.8	H	12.1	L	32.7	H	12.8	L	3	4
258	17.7	1.7	L	13.1	L	24.7	H	28.5	H	12.3	L	34.8	H	9.4	L	3	4

/ Rel. - Relation to 1921-36 yield, high or low.

These figures indicate that as a period, 1937-43 was neither a particularly high nor a particularly low yielding period, and that there is justification for including this period in the yield history as typical of long-time productivity.

The 1921-43 average yield for the whole area was 0.2 bushels higher than the 1921-36 average, in spite of the fact that the majority of rural municipalities had more low yielding than high yielding years in the 1937-43 period. This relative relationship was true for eight of the twelve municipal units. Three rural municipalities showed lower averages from 1921-43, as compared with 1921-36 and one rural municipality had the same average. (See table XV.)

TABLE XV.

COMPARISON OF 1921-1936 and 1921-1943 PERIOD AVERAGES BY RURAL MUNICIPALITIES
Elrose-Rosetown-Conquest Area.

R. M.	No.	1921-36 Average	1921-43 Average	Difference (1921-43)-(1921-36)
			bushels	
Montrose	315	10.7	10.9	0.2
Harris	316	11.8	12.5	0.7
Marriott	317	12.9	13.3	0.4
Mountain View	318	15.2	15.2	-
Fertile Valley	285	12.8	12.9	0.1
Milden	286	15.7	16.2	0.5
St. Andrews	287	18.2	19.0	0.8
Pleasant Valley	288	14.9	15.1	0.2
Coteau	255	13.4	13.3	-0.1
King George	256	14.2	13.9	-0.3
Monet	257	15.3	15.8	0.5
Fairview	258	17.7	17.3	-0.4
All R. M.'s		14.4	14.6	0.2

The 1921-43 yield history was used as the basis for productivity in this area, in preference to the 1921-36 yield average used in previous studies, since it was felt the longer yield history was more indicative of long-time productivity than the shorter period average.

The only source of wheat yield averages by which it was possible to check the reliability of the estimates obtained in the survey was with

those appearing in the Secretary of Statistics' Reports, Saskatchewan Department of Agriculture. The Economic Survey average for the 1921-36 period, for each municipal unit, was 0.3 bushels higher than the Secretary of Statistics' average. For the 1921-43 period, the Economic Survey average was 0.4 bushels higher. Which of the averages is the more reliable cannot be determined, but the differences are relatively small. Since the Secretary of Statistics' averages are given according to municipal units only, the Economic Survey averages are the only source by soil type.

Analysis of these data established the fact that in estimating wheat yields for past years there is a tendency to over-estimate yields in low yielding years and to under-estimate yields in high-yielding years. In addition, evidence was available to indicate that farmers tend to under-estimate earlier years and over-estimate the later years. Hence it was clear and advisable to use the longest-time average available.

SUMMARY

1. A total land area of 2,572,398 acres was included in this study, extending throughout the following twelve municipal units in west central Saskatchewan:

R. M.	No.	R. M.	No.
Coteau	255	St. Andrews	287
King George	256	Pleasant Valley	288
Monet	257	Montrose	315
Fairview	258	Harris	316
Fertile Valley	285	Marriott	317
Milden	286	Mountain View	318

2. The economic classification of land was based on the estimated potential productivity of quarter-sections of land in terms of wheat production. In conducting the classification, the greatest weight was given to the history of past performance of the land through long-time wheat yields for all soil types of the area. In addition, all relevant physical and economic information available was used in appraising each quarter-section - the basic unit of classification.

The key note of the classification was the marginal land class (Land Class II). Land of this grade, operated with average managerial ability in a unit of size average for the area, of typical organization and on the basis of its past record of production, could be expected to pay current farm expenses, including taxes and depreciation, as well as family farm living expenses. There would be no surplus to pay for the use of the land either as rent or interest or to discharge any debt obligations.

Using a budgetary approach and information obtained through various farm business studies in representative areas of the province, the following land classes and range of quantitative returns from the land were set up:

Land Class		Range in Bushels of Wheat for Sale per Quarter Section
I	Submarginal for wheat production	Less than 350 bushels
II	Marginal for wheat production	351 to 475 bushels
III	Fair wheat land)	476 to 720 bushels
IV	Good wheat land) Supramarginal	721 to 900 bushels
V	Excellent wheat land)	901 bushels plus

Some adjustments were made in the approximate range in bushels of wheat for sale due to differences in freight rates.

3. Arranged according to each grade of land the following distribution by percentage was made in this area:

Land Class	Percentage
I	30.4
II	16.9
III	20.4
IV	13.1
V	19.2

4. The summary of all lands included in land classification surveys conducted since 1936 by the Economics Division, in co-operation with the Department of Farm Management, University of Saskatchewan, includes a total area of 22.9 million acres and is found in some 112 municipal units. Following is the breakdown by land class:

Land Class	Brown Soil Zone	Dark Brown Soil Zone	Total
		Per Cent	
I	46.7	30.1	42.4
II	17.0	23.4	18.7
III	24.1	31.4	26.0
IV	9.6	7.7	9.1
V	2.6	7.4	3.8
Total	100.0	100.0	100.0
Total Area (000's)	16,990	5,920	22,910
Municipal Units (No.)	83	29	112

5. 1,727,666 acres of the total land area, 2,572,598 acres in the area of survey, were considered to be arable for crop production, and of this, 1,690,483 acres were improved at the time of the survey. Only 50 per cent of the balance of arable land was found in the desirable grades of land, i. e. Land Classes III, IV and V.

6. Private ownership of land was by far the most common type of ownership. About 78 per cent of all land was owned by private persons; 64 per cent by those actually operating the land or living in the locality, 6 per cent by private persons living elsewhere in Saskatchewan, and an additional 8 per cent by private persons living outside Saskatchewan, mainly in the United States. Private ownership of land was more common on the better grades of land. In Land Classes I and II, 45 and 86 per cent was of this type, while in Land Classes III, IV and V, the percentage was 92, 95 and 98.

About 10 per cent of the total land area was still held by the Crown, nine-tenths of which was in Land Class I (submarginal for wheat production) and used largely for grazing. Approximately 4 per cent was in the hands of the rural municipality. Again a large proportion of this type (94 per cent) was lands graded as Land Class I. This was due largely to the high incidence of tax delinquency and subsequent abandonment in the 1930's.

Lands held by mortgage, insurance and trust companies amounted to slightly more than those owned by the rural municipalities (4.5 per cent).

About two-thirds of these lands were in Land Classes I and II, largely in the submarginal grade. Only about 13 per cent of these lands were rated as good or excellent wheat lands. Of the other types of land ownership, those owned by railway companies and by the Hudson's Bay Company were most prominent and approximately 72 per cent was graded as Land Class I.

7. Outside of lands graded as submarginal for wheat production (Land Class I), nearly all lands (about 99 per cent) were occupied by a resident in the vicinity or nearby and used for farming or grazing purposes. In Land Class I, only 63 per cent of the lands was occupied while about 25 per cent was vacant (not in use in 1944 and on which no appreciable amount had been cultivated), about 10 per cent was in P.F.R.A. community pastures and only 2 per cent was abandoned (once occupied and farmed and subsequently thrown out of use).

8. At the time of the survey, approximately 92 per cent of the occupied land was being used for grain farming or forage production. Three per cent was leased and used for grazing and hay purposes and 3.3 per cent was in community pastures and used for grazing.

The percentage of owned occupied land ranged from 36 per cent for Land Class I to 65 per cent for Land Classes IV and V. The percentage of rented occupied land was relatively constant for each land class, ranging from 33 to 42 per cent.

9. A high degree of correlation was noted between the assessed value per acre and land class. Taking all land in each land class having assessment information, the average figure increased from $3.42 in Land Class I to $7.72 $12.37, $18.72 and $25.32 for Land Classes II, III, IV and V, respectively. The range of values in the same land classes, as assessed in different municipalities, was not great though proportionately wider in the lower than the higher classes; the variations of range to average valuation being in Land Class I - 48 per cent, Land Class II - 25 per cent, Land Class III - 20 per cent, Land Class IV - 12.5 per cent and Land Class V - 12 per cent.

10. Respecting soil erosion and stating the problem in terms of parcels of land (usually 160 acres), approximately 16 per cent of the 12,802 parcels had no erosion damage, 63 per cent was affected by wind damage, 6 per cent by water damage and 15 per cent were affected by a combination of wind and water. A total of 66.4 per cent of all parcels had over 80 acres affected, mainly in the slight to moderate category of extent and severity. Approximately 98 per cent of all parcels of land were slightly to moderately affected by erosion, while 1.7 per cent were moderately to severely affected and 0.4 per cent or 43 parcels were severely affected.

In terms of acreage affected, approximately one-third of the improved land was not affected, about one-half had wind damage, 4 per cent had water erosion and the balance had combined wind and water damage.

Wind damage was most pronounced on the poorer grades of land, Land Classes I, II and III, and water damage was of greatest significance on the heavier textured soils included in Land Classes IV and V. The percentage affected by water was about 2 per cent on the poorer grades of land, approximately 5 per cent on the good wheat lands and 8.3 per cent on the excellent wheat lands.

The main damage has been through wind erosion and of widest extent on the poorer grades of land. On these grades of land about 10 per cent of the improved land was affected either very severely or moderately severely. While damage of the moderately severe or very severe category was inextensive on the better grades of land, the whole problem of soil erosion and soil conservation warrants close attention by farmers and scientific workers.

11. A wide range of average wheat yields was noted when the information was arranged according to soil type or group. In this study, soil types were arranged into groups of 6 point intervals, according to their comparative soil rating. Soil Group I, with a comparative soil rating of 80 points and over, had a 1921-43 wheat yield average of 18.9 bushels per acre. The average yield for the same period for Soil Group X, which had a comparative soil rating of 31 points or less, was 8.8 bushels for all soil types in that group.

The complete range of 1921-43 average wheat yields in this area was as follows:

Soil Group	Bushels per Acre
I	18.9
II	17.0
III	15.7
IV	14.8
V	13.9
VI	13.7
VII	13.0
VIII	12.2
IX	10.5
X	8.8

A total of 606 records were obtained from farmers in the area with information respecting wheat yields. These were found on some 64 different soil types. Some of the 1921-43 wheat yields for typical soil types are as follows:

Soil Type	Symbol	1921-43 Average Wheat Yield
Regina Heavy Clay	RHvC	18.9
Sceptre Heavy Clay	ScHvC	16.3
Fox Valley Silty Clay	FxSiC	15.9
Haverhill Clay Loam	HrCL	14.6
Elstow Silty Clay Loam	ESiCL	14.5
Sceptre Clay	ScC	14.0
Elstow and Weyburn Loam	E-WL	13.7
Haverhill Loam	HrL	13.0
Asquith Light Loam	ALL	11.9
Asquith Fine Sandy Loam	AFL	10.5
Hatton Light Loam	HtLL	8.8